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PEANUT STRIPE VIRUS

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During the 1982 peanut growing season, virus symptoms previously unknown to the United States were observed in new peanut germplasm obtained from the People's Republic of China (3). This germplasm was under observation at the regional plant introduction station at the University of Georgia at Experiment. J. W. Demski (2) identified this virus as peanut stripe virus (PStV), which may be synonymous with a virus described recently from the People's Republic of China (5).

In 1983, surveys of some commercial fields and many experimental peanut plantings of universities from Texas to Virginia and Florida indicated that the virus problem was predominantly limited to breeding plots (4). In early 1984, at least 40 seed lots from the Florida peanut breeding programs at Marianna and Gainesville and a limited number from foundation seed lots were indexed by J. W. Demski in Georgia (4). Four of the 40 lots were positive for PStV and were not planted this year. The virus was not detected in foundation seed, however.

Concurrent with seed indexing, infected peanut plants from Georgia were received in the quarantine greenhouse at the Florida Division of Plant Industry. D. E. Purcifull of the Institute of Food and Agricultural Sciences (IFAS), University of Florida, inoculated healthy peanuts with the virus. The virus was isolated and purified, and antiserum to the purified virus was produced (D. E. Purcifull and E. Hiebert, personal communication).

During June 1984, PStV-infected plants were found in IFAS experimental plantings in Gainesville and Marianna. Diagnosis of PStV was based upon symptomatology, serological techniques, and the presence of characteristic virus-caused inclusion bodies in the host cytoplasm (D. E. Purcifull and R. G. Christie, personal communication).

SYMPTOMS FOR SURVEY AND DETECTION: A discontinuous dark-green striping along lateral veins of newly-infected peanuts and an oakleaf pattern on leaves of older, infected peanut plants are the two characteristic symptoms of PStV (Fig. IA). A PStV symptom variant, "green blotch" (Fig. 1B), occurs on about 5% of infected plants (J. W. Demski, personal communication). It can be reproduced by inoculating from a "green-blotch" plant onto a healthy plant.

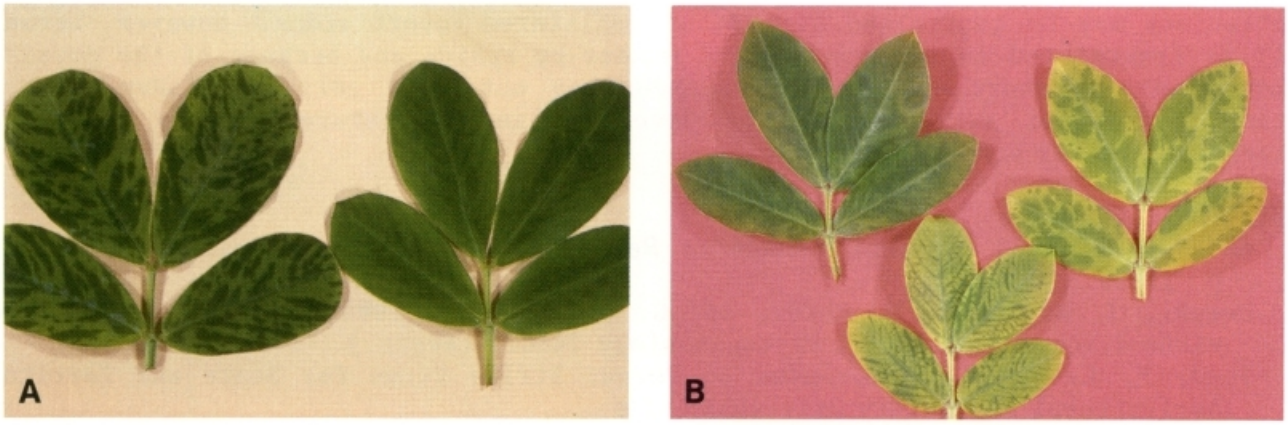

Fig. 1. Peanut stripe virus (PStV) and peanut mottle virus (PMV). A) Early stage of PStV infection, discontinuous striping along lateral veins (left); later stage of PStV infection, oakleaf pattern (right). B) Stripe symptom of PStV (lower leaflet) compared with mottle symptom of PMV (leaflet, upper left) and with "green-blotch" variant of PStV (leaflet, upper right). (Photos by J. W. Demski)

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Peanut mottle virus (PMV), which is common in Florida, may be confused with PStV. Peanuts affected with PMV show a mild leaf mottling (Fig. 1B), i.e., marbling of colors with rings, spots, streaks, or blotches. Leaf margins are frequently curled upward and lateral interveinal tissue is depressed with PMV infections. Peanut stunt virus (PSV) is relatively rare in Florida and shows symptoms distinct from PMV and PStV. Peanuts infected with PSV are severely stunted and the leaves are chlorotic and smaller than normal.

VIRUS CLASSIFICATION: PStV belongs to the potyvirus (potato virus Y) group. Members of this group have flexuous rod-shaped particles and are characterized by cylindrical inclusions in the host cytoplasm. Most potyviruses are aphid-transmitted in a non-persistent manner (i.e., aphids can transmit the acquired virus for a short period of time--about a minute). Some potyviruses are transmitted through the seed of certain hosts.

VIRUS TRANSMISSION: PStV is vectored by Aphis craccivora Koch (cowpea aphid). There are likely to be other aphid vectors, but they have not yet been tested. The virus is seed-borne in peanuts. J. W. Demski (personal communication) has demonstrated seed transmission rates up to 30% in greenhouse trials.

HOSTS (J. W. Demski, personal communication): Arachis hypogaea L. (peanut), 12 cultivars (all cultivars tested to date); Glycine max L. (soybean) (some varieties are resistant); Sesamum indicum L. (sesame); Trifolium incarnatum L. (crimson clover); Vigna unguiculata L. (cowpea) (some varieties are resistant); and Lupinus albus L. (white lupine).

DISEASE POTENTIAL: Florida has nearly 60,000 acres of peanuts. The value of pea-nuts produced in Florida in 1981 was over 48 million dollars (1).

In greenhouse tests, 20% yield reductions were observed by J. Demski (personal communication). However, field testing is needed to make reliable estimates on losses. Concern is warranted with PStV due to the high frequency of seed trans-mission, the abundance of the aphid vector in Florida, a host range consisting of plants grown extensively in northern Florida, and the long peanut-growing season.

CONTROL: Efforts are being made by the University of Florida to contain the virus and prevent its spread to commercial seeds by destroying infected experimental peanut plantings. Roguing is another method of control but would not necessarily be reliable since symptoms are not always evident on recently infected plants. Aphid populations may be controlled by various registered insecticides. However, because PStV is transmitted in a nonpersistent manner by aphids and because of the possible presence of migratory aphids, insecticides may not be a reliable disease control method. Resistant varieties may be developed in the future, but no commercial varieties thus far seem to be resistant.

LITERATURE CITED:

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